

Appendix 14

Recommended Management Practices for Controlling Sudden Oak Disease (SOD)

1. General Management Practices for operations where products do not move from the state are as follows:
 - a. A "free-from" survey can be conducted and, if no infected hosts are found, no additional mitigations are required. If the survey is conducted it must be conducted by an RPF or other approved person that has attended training for survey and sampling, and is certified as an official sampler, and the plan must explain how the survey was conducted as explained in the training. The "free-from" certification and the approved harvest document explaining the survey process acts as the compliance agreement and the SOD mitigation measures.
 - b. Currently there is no provision that allows moving any host material out-of-state under the federal regulations without removing all bark prior to shipment out-of-state.
 - c. If a "free-from" survey is not conducted, all hosts are assumed to be infected and SOD mitigations as discussed below should be included in approved harvest documents and shall be discussed during the on-site RPF-LTO meeting prior to commencement of timber operations (14 CCR 1035.2).
2. When a free-from survey has not been conducted, the following Management Practices should be incorporated into THPs prepared on JDSF lands to prevent the spread or introduction of SOD:
 - a. Commercial Harvest on a Regulated Site Where Infected Trees Are Not Being Harvested:
 - Regulations for movement of host material still apply even though logs are not removed from the site. Infected host material (especially foliage) could be picked-up on logging equipment and transferred to other sites. Mitigation measures to minimize the unintended movement of host material are required. Forest Staff or contractors shall complete inspection of loads of logs and equipment leaving the site to ensure that no host material is being transported without a permit. This may require cleaning dirt or mud from the vehicle to remove host plant material embedded in the dirt or mud, depending on conditions when the timber harvest is conducted.
 - If firewood from host material is being removed from the site for commercial or private use, a compliance agreement must be in place. The information as to where and what is being removed, how it will be transported, specifically where it will be moved to, and during what time period should be included in the harvest plan if the plan will act as the compliance agreement. If this information is not included in the plan, a separate compliance agreement will be necessary prior to movement of host material. In addition to the compliance agreement, contractors removing firewood on the Forest must still have the required firewood permit.

b. Commercial Harvest On An Infested Site Where Infected Trees Will Be Harvested:

- State and Federal regulations apply. Host material cannot leave the site except as authorized by the County Agricultural Commissioner and/or mitigation measures specified in the approved harvest document. Infected host material (especially foliage) and contaminated soil could be picked-up on logging equipment and transferred to other sites. Mitigation measures to minimize the unintended movement of host material are required. Forest staff or contractors shall do inspection of loads of logs and equipment leaving the site to ensure that no host material is being transported without a permit. This may require cleaning dirt and mud from the vehicle to remove host plant material contained in the dirt or mud, depending on conditions when the timber harvest is conducted.
- If firewood from host material is being removed from the site for commercial or private use, a compliance agreement must be in place in addition to the required firewood permit. The information as to where and what is being removed, how it will be transported, specifically where it will be moved to, and during what time period, should be included in the harvest plan if the plan will act as the compliance agreement. If this information is not included in the plan, a separate compliance agreement will be necessary prior to movement of host material.
- In the regulated area, the collection of minor special forest products that are known host plants will be restricted to areas where the "free-from" protocol has been implemented, or where a compliance agreement is in place.

3. Should SOD be identified on JDSF lands, Management Practices to minimize the unintended movement of host material from infested areas include:

- a. The RPF shall inform personnel that they are working in an SOD-infested area, unauthorized movement of plant material is prohibited, and the intent of the mitigation measures is to prevent disease spread (914 CCR 1035.2).
- b. If some sites in the general operating area are found to be disease-free or have a low incidence of disease, initiate and complete operations on these sites before moving to more heavily infested sites.
- c. To the extent practical, locate landings, log decks, logging roads, tractor roads, and other sites of equipment activity away from host plants, especially areas with disease symptoms.
- d. Route equipment away from host plants and trees, especially areas with disease symptoms.
- e. The equipment or vehicles must be inspected for host plant debris (leaves, twigs, and branches each time equipment or vehicles leave the site. Host plant debris must be removed from the equipment and vehicles prior to their departure. This applies to all equipment and vehicles associated with the operation, including logging equipment, log-hauling trucks, pick-up trucks, employee's personal vehicles, etc. An exception will be granted for equipment or vehicles that leave the site temporarily and will not be traveling to uninfested areas prior to their return.

- f. In addition to following California Department of Fish and Game (CDFG) drafting guidelines (intake mesh size, etc.), water should not be drafted from a watercourse in a SOD-infected drainage and used in an uninfested area. This is because sporangia from infected leaves (or minute parts of infected leaves), themselves in the watercourse, could be suctioned in the draft and transported to new areas. Infection could be possible if abatement over-spraying landed on susceptible hosts.
4. Management Practices to minimize the unintended movement of soil and host material from infested areas (these practices are not specifically required for operations on infested sites, but the RPF must state and justify what practices will be used to minimize the unintended movement of infested host material):
- a. The SOD fungus resides in soil and duff in infested areas and soil/duff is therefore a potential carrier of the disease. The greatest threat of disease spread occurs when wet soil is present. Soil movement should be addressed.
 - b. Because wet soil and mud will readily adhere to vehicles, equipment, and boots: conduct operations during the dry season; utilize paved and rocked roads and landings to the extent possible.
 - c. After working in an infested area, remove or wash off accumulations of soil, mud, and organic debris from shoes, boots, vehicles and heavy equipment, etc. before traveling to an area that is not infested with SOD. Consider establishing an equipment power wash station. The station should be:
 - Located within the generally infested area.
 - Paved or rocked.
 - Well-drained so that vehicles exiting the station do not become recontaminated by the wash water.
 - Located where wash water and displaced soil does not have the potential to carry fines to a watercourse (see "Saturated Soil Conditions" in 14 CCR 895.1).
 - d. Pay particular attention to sites where soil and organic debris may accumulate.
5. Management Practices should Pitch Canker be identified on JDSF lands:
- a. The timely removal and disposal of trees dying from pitch canker may help prevent the buildup of destructive beetles which can attack other trees, and can carry the pitch canker pathogen to uninfested trees. The disposal of pitch canker diseased material should be done on-site so as not to spread the disease to uninfested areas. Limbs and small pieces of wood may be left on-site or they may be chipped or burned. Logs cut from pitch canker diseased trees may be split for firewood for local use, but the wood should be seasoned beneath a tightly sealed, clear plastic tarp to prevent the buildup of destructive insects. California Department of Forestry and Fire Protection Tree Note #3, Controlling Bark Beetles in Wood Residue and Firewood, provides specific guidelines

for placing tarps over and around firewood. Do not stack pine firewood next to living pine trees or transport it to uninfested areas (Sanford, 1996).

- b. The distribution of the disease is discontinuous; thus, there are infested as well as uninfested areas within the Zone of Infestation (at the time this document was prepared, pitch canker was not known to occur on JDSF). The Pitch Canker Task Force of the California Forest Pest Council and CDF have ongoing monitoring underway for the disease. JDSF staff should report any symptomatic Bishop pines to the Task Force for determination of presence of pitch canker. CDF and the Mendocino County Agricultural Commissioner shall be notified immediately in the event that pitch canker is found on JDSF.
- c. Directions for Registered Professional Foresters and Licensed Timber Operators:
 - Know when you are working within an infested area.
 - The California Department of Forestry and Fire Protection (CDF) has the authority to impose conditions on the commercial harvest of trees from timberland within the Zone of Infestation. Such actions are to be carried out on a case-by-case basis and depend upon the harvest operation's potential to contribute to disease spread. For all timber operations regulated by the Department, the Department must be informed if pitch canker is present within the operating area.
 - Do not transport infected or contaminated material to areas that are free of the disease.
 - When cutting or pruning a diseased tree, clean tools with a disinfectant before using them in uninfested areas. Lysol® is an effective sterilizer. Make sure that clients and co-workers are aware of these guidelines (Pitch Canker Task Force, 2000a).
- d. Directions for Firewood Cutters:
 - JDSF personnel should be kept informed whether pitch canker is determined to be present on the Forest. Any suspect areas shall be avoided for firewood harvest until an official determination is made as to presence or not of the disease. At time of firewood permit issuance, JDSF personnel shall direct firewood cutters to disease-free areas of the Forest. Information on pitch canker disease recognition and regulations shall be provided with the collection permit in the event that pitch canker becomes present on the Forest.
 - Tools and machinery that are to cut trees with pitch canker disease WILL BECOME CONTAMINATED with the pitch canker fungus. There is little chance of spreading pitch canker if contaminated tools are only used on dead trees or on trees that are not pines. However, if contaminated tools or machinery will be used on living pines, the tools should be cleaned and sterilized before use on uninfected trees or in uninfested areas. Lysol® is a suitable sterilizer for this purpose. A logical alternative to repeated cleaning of equipment is to reserve one set of equipment for use only in infested areas, and another set for use only in uninfested areas.

- **Do not transport pine firewood out of infested counties (Mendocino County is an infested county). Sell pine firewood locally, for local use guidelines (Pitch Canker Task Force, 2000a).**

e. Directions for Other Forest Product Harvesters:

- JDSF personnel, at time of collecting permit issuance shall direct collectors to disease-free areas of the Forest. Information on pitch canker disease recognition and regulations shall be provided with the collection permit.
- Collectors shall not be permitted to remove pine products from trees infested with pitch canker disease.

f. Directions for Reforestation in Areas Affected by Pitch Canker:

- Material for replanting should be as local in origin as possible to retain the genetic integrity of the local population (Pitch Canker Task Force, 2000b).
- Option 1. The preferred strategy for reestablishing Bishop pine would be to allow natural regeneration to occur. Site improvement to encourage regeneration may be required where a dense overstory precludes the development of a seedling stand. Where natural regeneration does occur, it can be expected that pitch canker will eventually infect some or most of the young trees. However, the trees will vary in their susceptibility and some may sustain little or no damage. This is the least intrusive approach to reforestation, with the possibility that a level of pitch canker resistance will be attained that eventually provides the desired density of mature trees (Pitch Canker Task Force, 2000b).
- Option 2. If option one is acceptable in principle but there is insufficient seed to produce a stand, locally collected seed could be introduced. By collecting seed from asymptomatic trees, there is more likelihood that some are resistant, and a certain percentage of the progeny will carry this trait as well. It is thought that a small percentage of resistant individuals may be sufficient to establish a stand. To diversify the seed source, it is recommended that seed be gathered from: (1) multiple trees, at least 100 meters apart where possible, (2) trees of differing ages, and (3) different heights within the same tree. Trees that have been planted should be avoided, as they may be non-local in origin. In addition, trees with evidence of disease or poor health should not be used as a seed source (Pitch Canker Task Force, 2000b).
- Option 3. The least desirable measure for maintaining Bishop pine presence is to transplant known resistant seedlings from a reputable source. The potential loss of genetic integrity could result in a nonnative stand (Pitch Canker Task Force, 2000b).